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ESS 580

THE FUTURE OF THE LIVESTOCK INDUSTRY

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The audacity of the title of this presentation, "The Future of the Livestock Industry" may be more manageable for us all if you will recognize the difference between an assigned title and a selected one. I do not have any personal certainties about the future of the livestock industry. I am not a prophet. I cannot give you answers about the future of anything. But I can speculate with you a bit. I can ask you questions. Some of them may trouble you, and maybe you will think about them. And then you won't be surprised if they happen. In any industry, you know, being surprised by change is a lot like racing a freight train to the railroad crossing: if it's a tie, you lose.

Much of the data we are about to examine is published by the USDA on the basis of census regions. So it is helpful to begin this assessment by looking once again at those census regions and considering some of the implications of the regional boundaries.

FIGURE 1: A few things in particular are worth noting: Notice first of all how large the South is, and how heterogeneous. The region includes everything from the Delmarva Peninsula to the Big Bend country in Texas. All of you are aware surely that this region contains the complete spectrum of variation in U. S. climate, topography, and agricultural enterprise. When you speak of trends or changes it is not very useful to generalize

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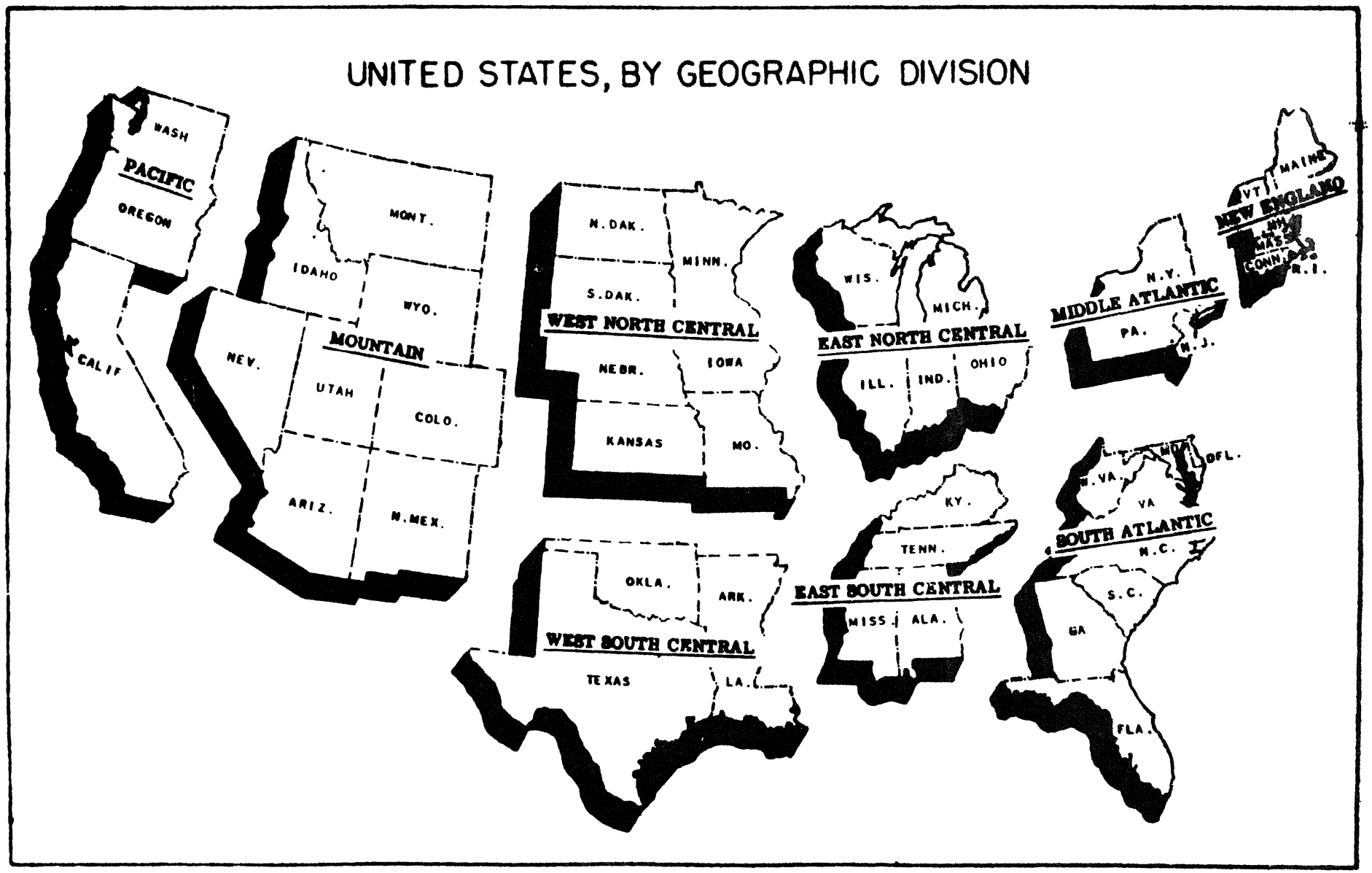
1/ Presented at the Midwest Agricultural Outlook Conference, Columbus, Ohio, August 15, 1979. Copies may be obtained by requesting ESS 580 Department of Agricultural Economics, The Ohio State University, Columbus. The author is grateful to James D. Long who, as an undergraduate individual studies student, assisted in the preparation of some of the tables and figures during this summer term at Ohio State. The paper contains, in places, material that will appear in a forthcoming research bulletin from OARDC for Hatch 582.

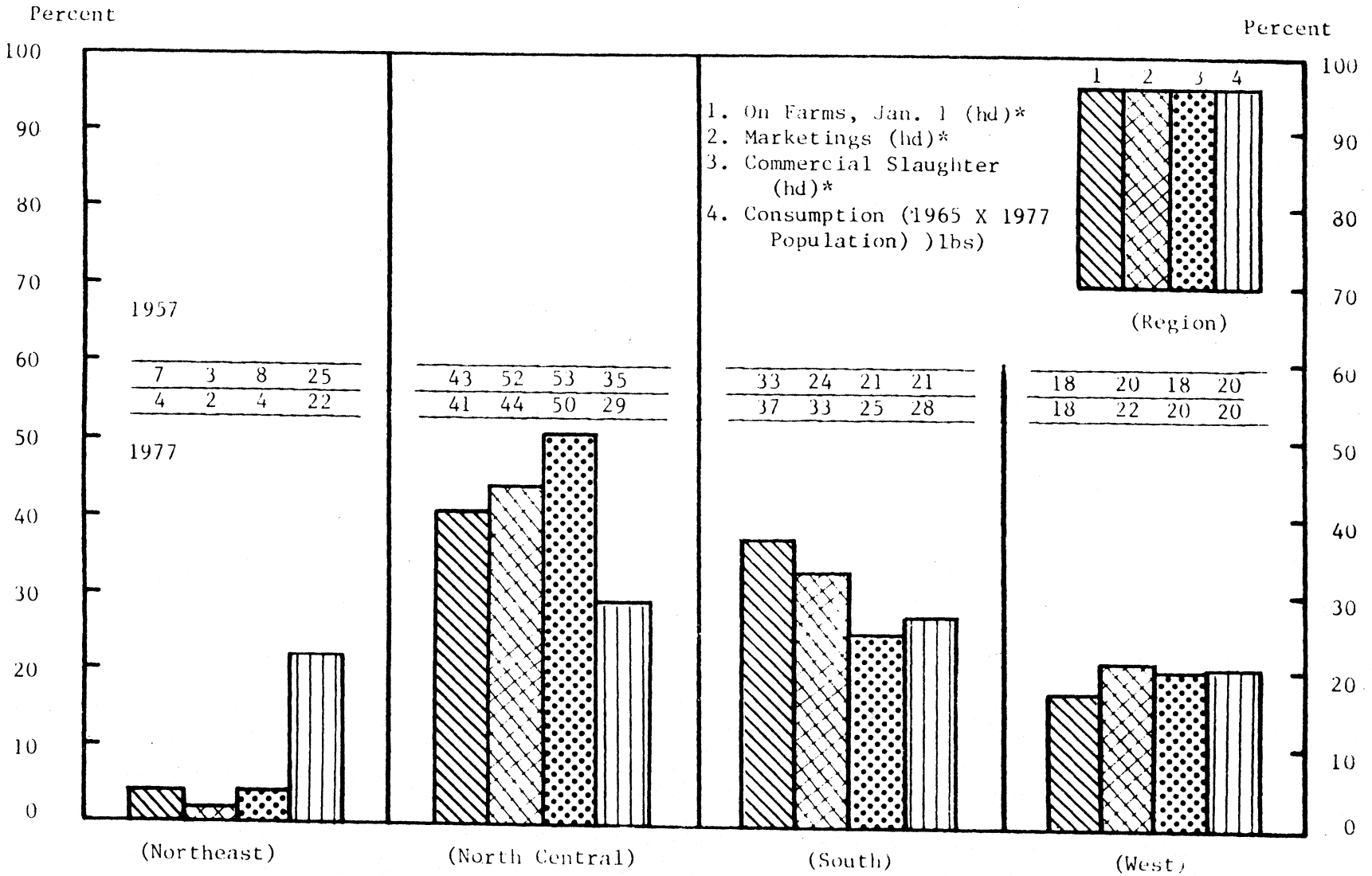
FIGURE 1: CENSUS REGIONS



the South. It is wiser to identify specific states. Also it is worth noting, as we shall presently see, that the major regional shift in the cattle industry has been into the five states of Colorado, Nebraska, Kansas, Oklahoma and Texas. Notice that this cluster of adjacent states spans the boundaries of three census regions. So published data based on census regions rather than on states is likely to mislead an unsuspecting reader by understating the magnitude of this migration in the cattle industry. It is also useful to recollect from our earliest instruction in agriculture that it has been for many decades a characteristic of the livestock industry to move westward. So this change is nothing new. What is new is the speed and magnitude of it in the last two decades.

FIGURE 2: Here is a figure that provides an overview of the cattle industry. Notice that is is divided into four parts representing the four major census regions. Within each region are four bars representing the percentage contribution of that region to the U. S. total of four major aspects of the cattle industry. They are, in this order: beginning inventory (January 1), marketings, commercial slaughter, and consumption. Two years are compared: 1957 and 1977. Through the middle of the figure is a double row of numbers representing the percentage contribution of each region to the national total for each of these four aspects of the industry. The top row is for 1957. The bottom row is for 1977. The bars that show in the figure are a graphic presentation of the 1977 percentage numbers. The figure contains more information than we can summarize in brief. But consider four items: (1) It appears that the cattle industry cannot be said to be dominated by any particular region. But we know this is not true. The industry can arguably be said to be dominated by a region that does not appear in this presentation, and that is the cluster of five states that is scattered among three regions in

Figure 2. Cattle: Percent on Farms January 1, Marketings, Commercial Slaughter, and Beef Consumption, by Regions, United States, 1977.



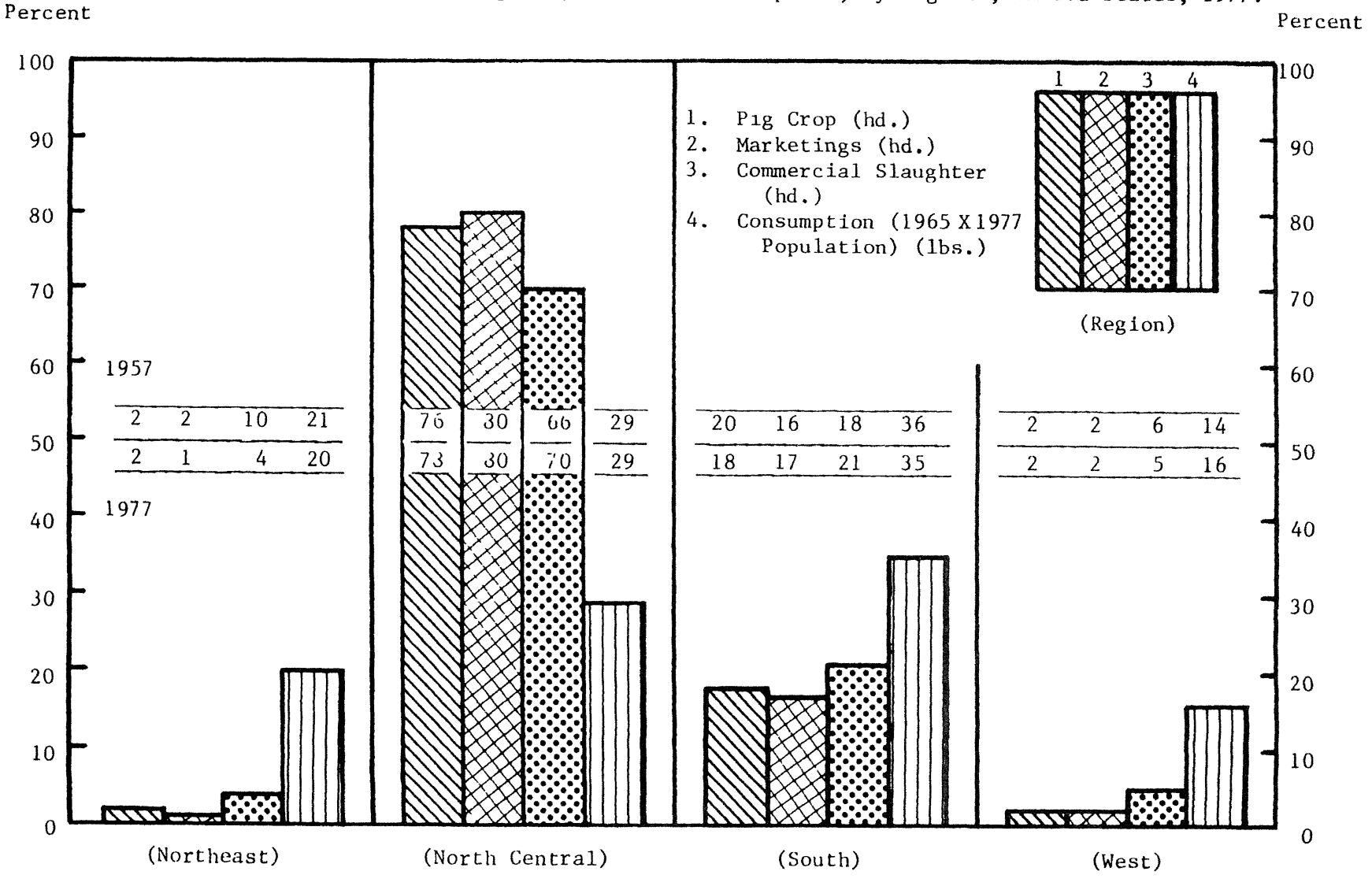
* All cattle over 500 lbs., including dairy cattle.

Source: Livestock and Meat Statistics, annual supplements, and 1965 Household Food Consumption Survey, USDA.

Figure 2. (2) Major regional shifts in various activities can be identified by comparing the numbers for 1957 and 1977. (3) The Northeast region is grossly deficit in its ability to provide for its own needs and it appears reasonable to suppose that the North Central region will continue to be the solution to that problem. That is to say, there will always be a Northeast market for North Central beef. (4) The biggest net changes that appear here are between the North Central and the South. Substantial declines in percentages in the North Central states are more than matched by substantial percentage increases in the South; and this despite the fact that the North Central region includes Nebraska and Kansas, which are two of the five major growth states. This suggests that if we were to examine state data we would find more massive changes than those that can be detected by this regional data. For example, if the North Central region here registers a net percentage decline despite the growth of a few well-known states, then what sorts of declines must be appearing elsewhere, as in, say, the East North Central states? We can examine that presently, but first let us take a brief look at a figure for the hog industry which, in format, is identical to this figure for the cattle industry.

FIGURE 3: One thing is quickly evident: relative to cattle, the hog industry is Cornbelt-dominated. Comparing the 1957 and 1977 percentages suggests that this condition is a stable one and likely to continue. Now during the same span of years we have from time to time heard much about the growth of the hog industry in the (ungeneralizable) South. But some growth in one or two South Atlantic states does not show any regional impact. The biggest percentage changes that appear in this figure relate to the migration of the packing industry out of the Northeast and into the North Central region and the South. Most notable of all is that the North Central region is the only net exporter of pork: It ships pork in every

Figure 3. HOGS and PORK: Percentage Distribution of Pig Crop, Hog Marketings, Commercial Slaughter, and Pork Consumption, by Regions, United States, 1977.



Source: Livestock and Meat Statistics, annual supplements, and 1965 Household Food Consumption Survey, USDA.

direction from the center of the continent to the edges. It could do the same for the world, as it once did, if more progressive marketing methods develop which recognize and reward the genetic improvements that have occurred in hogs over the past 20 years. I suspect that a growing world market for U. S. pork is a reasonable prospect for us to anticipate as the future unfolds. Let us look at some more detail, now, about these cattle and hog industries, as one would read the news story beneath the headlines these figures provide.

TABLE 1: Table 1 summarizes changes in cattle marketings by states and regions for selected years since 1960. It is the kind of data from which bar 2 could be determined for Figures 2 and 3. You can see that this has been a growth industry. It has grown so rapidly that individual states or regions could register a percentage decrease even though they market more cattle now than at any time since 1960. Notice that, despite the overall growth, the industry has stabilized or even declined in some individual states. The East North Central states provide perhaps the most notable example.

TABLE 2: Let us look even deeper for some change: Table 2 inquires not just about cattle marketings but about fed cattle marketings. Not just beef. Fed beef. Consider what this table really says. It says that while cattle marketings increased 58 percent since 1960 (Table 1), fed cattle marketings increased 104 percent! Perhaps another way to think of it is that while all cattle marketings increased substantially, marketings of cattle that would grade good or better had doubled! That's amazing. And perhaps frightening. Do you suppose that the fed cattle industry, which has flourished since World War II, just like the automobile industry, might possibly, over the long span of time, in retrospect look like an

Table 1: Marketings of All Cattle Excluding Calves, Selected States, United States, Selected Years, 1972-1978

(1000 head)

State and Region	1972	1974	1975	1976	1977	1978
Northeast	890	801	855	877	873	900
North Central	23,911	22,278	23,134	25,122	24,705	24,091
Ohio	833	594	838	835	879	746
Indiana	655	687	686	851	815	935
Illinois	1,731	1,465	1,312	1,654	1,641	1,413
Michigan	495	442	500	507	558	602
Wisconsin	803	728	923	997	840	754
Minnesota	1,843	1,571	1,798	1,998	1,919	1,590
N. Dakota	675	827	962	887	813	602
S. Dakota	1,771	1,945	2,215	2,556	1,697	1,855
Iowa	4,672	4,362	4,103	4,468	4,542	4,759
Missouri	1,615	1,556	2,075	2,066	2,085	2,006
Kansas	4,530	3,957	3,708	4,108	4,715	4,392
Nebraska	4,288	4,144	4,014	4,195	4,201	4,437
West	12,353	11,336	11,984	12,071	12,138	11,856
Washington	394	396	415	509	424	307
Oregon	416	390	589	456	444	413
California	3,015	3,015	2,904	2,917	2,651	2,569
Montana	880	1,007	1,069	1,091	1,097	933
Idaho	740	590	859	647	690	698
Wyoming	649	635	788	775	1,027	800
Nevada	168	174	175	191	165	154
Utah	239	194	262	299	266	269
Colorado	3,381	2,743	2,535	2,835	3,015	3,264
New Mexico	1,282	1,028	1,397	1,309	1,424	1,387
Arizona	1,189	1,164	991	1,042	935	1,062
Southern Plains	8,882	10,008	11,377	10,747	11,245	10,803
Texas	5,994	6,964	8,091	7,397	8,108	7,734
Oklahoma	2,888	3,044	3,286	3,350	3,137	3,069
All Other South	4,885	3,819	6,926	6,531	7,317	6,720
U. S. Total*	50,921	48,243	54,276	55,348	56,278	54,370

Table 1 (cont'd): Marketings of All Cattle, Excluding Calves, Selected States, United States, Selected Years, 1960-1970

(1000 head)

State and Region	1960	1962	1964	1966	1968	1970
Northeast	900	1,040	994	1,037	975	951
North Central	17,565	18,620	20,934	22,817	23,114	22,043
Ohio	680	803	880	869	828	798
Indiana	835	765	815	760	732	711
Illinois	2,194	2,155	2,264	2,280	2,059	1,725
Michigan	453	469	502	617	492	434
Wisconsin	735	752	807	901	825	777
Minnesota	1,592	1,643	1,777	1,961	1,970	1,789
N. Dakota	431	506	694	800	741	575
S. Dakota	1,192	1,238	1,502	1,698	1,984	1,839
Iowa	3,712	3,777	4,297	4,814	5,007	4,839
Missouri	1,304	1,402	1,479	1,548	1,672	1,648
Kansas	2,186	2,714	3,112	3,283	3,200	3,383
Nebraska	2,251	2,396	2,805	3,286	3,604	3,525
West	7,528	8,003	8,651	9,917	10,439	11,277
Washington	284	312	368	410	452	339
Oregon	365	404	411	526	526	485
California	2,221	2,505	2,568	2,894	3,017	2,908
Montana	703	535	736	885	937	874
Idaho	497	488	570	640	618	664
Wyoming	472	407	495	579	640	581
Nevada	143	122	123	153	132	155
Utah	230	211	200	234	213	227
Colorado	1,360	1,566	1,714	2,066	2,197	2,695
New Mexico	584	637	670	694	757	1,245
Arizona	669	816	796	836	950	1,104
Southern Plains	4,444	4,823	5,526	6,354	6,337	7,751
Texas	3,207	3,490	3,842	4,346	4,338	5,354
Oklahoma	1,237	1,333	1,684	2,008	1,999	2,397
All Other South	3,921	3,994	4,356	4,913	4,920	4,842
U. S. Total	34,378	36,470	40,461	45,038	45,785	46,864

Source: Meal Animals 1977-1978, Economics, Statistics, and Cooperative Services, USDA, April 1979. (for 1978,1977)
Livestock and Meat Statistics, ESCS, USDA, Supplements for 1977, 75, 73, 72,70, 67, 65, 62, 61.
*Excludes Alaska and Hawaii.

Table 2: Reported and Estimated Marketings of Fed Cattle from 26 States, Selected Years, 1960-78
(Marketings in Thousands)

State	1960	1962	1964	1966	1968	1970	1972	1974	1975	1976	1977	1978
Ohio	316	376	447	453	453	429	438	386	379	678	403	382
Indiana	327	355	459	470	482	517	478	361	346	365	352	396
Illinois	1,255	1,265	1,371	1,333	1,276	1,167	1,003	850	805	935	940	980
Minnesota	600	609	745	713	905	877	935	864	762	804	758	755
Iowa	2,565	2,687	3,174	3,580	4,369	4,583	3,896	3,097	2,645	2,905	2,862	3,242
Missouri	483	542	586	714	716	684	604	400	338	346	323	295
South Dakota	362	451	590	563	660	552	561	585	561	579	572	555
Nebraska	1,434	1,822	2,436	2,781	3,461	3,609	3,990	3,355	2,795	3,458	3,785	4,170
Kansas	593	774	1,031	1,162	1,332	1,890	2,405	2,240	2,264	3,084	3,287	3,471
Texas	477	756	971	1,412	1,970	3,138	4,308	3,899	3,067	3,947	4,227	4,915
Colorado	738	815	951	1,276	1,438	1,905	2,291	1,892	1,838	2,134	2,301	2,455
Arizona	466	568	600	608	703	860	899	891	729	795	646	633
California	1,595	1,844	2,061	2,219	2,068	1,966	2,062	2,002	1,649	1,844	1,612	1,415
Oklahoma	143	186	270	369	419	542	626	566	515	678	732	833
Pennsylvania	146	142	123	135	139	128	130	123	117	114	115	110
Michigan	180	208	208	230	243	254	251	242	244	271	277	271
Wisconsin	164	168	175	190	202	217	214	180	186	182	179	170
North Dakota	176	136	182	157	118	90	85	84	67	71	63	66
Montana	115	100	128	168	157	184	247	187	132	104	134	118
Idaho	231	221	255	305	412	434	428	344	330	340	438	495
Utah	117	111	133	139	100	--	--	--	--	--	--	--
Wyoming	82	72	59	65	69	--	--	--	--	--	--	--
New Mexico	113	129	166	204	316	393	376	355	261	306	294	337
Nevada	45	31	38	49	60	--	--	--	--	--	--	--
Washington	220	258	290	290	332	348	375	301	315	364	389	406
Oregon	117	148	147	189	181	166	143	126	149	157	172	175
26 States	13,060	14,774	17,596	19,774	22,583	24,993[1/]	26,835[1/]	23,330[1/]	20,494[1/]	24,170[1/]	24,861[1/]	26,645
Fed Cattle as a % of Total Cattle Mktgs.	38.0	40.5	43.5	43.9	49.3	53.3	52.7	48.4	37.8	43.7	44.2	49.0[1/]

1/ 23 state total.

Source: For years before 1967, Livestock and Meat Situation, ESCS, USDA, May, 1967. For 1968, compiled from Cattle on Feed, SRS, USDA, January issues, and Packers and Stockyards Resume, Statistical Isuse, December 19, 1969, November 29, 1972, and December 15, 1972. For 1970-79, Livestock and Meat Statistics Annual Supplements. For 1978, Cattle on Feed, ESCS, USDA, January 19, 1979.

American post-war indulgence? Just like the auto industry? Odd, isn't it, that we might be justified in using the auto industry as a clue to what might happen to the cattle feeding industry? Look at the change that is occurring in the auto industry to economize on what has been very wasteful energy conversion. Among red meats and poultry, fed beef is a notoriously poor energy converter. Might there be some energy economizing to be expected in the cattle feeding industry? I think so. What, after all, has been the historic purpose in feeding cattle? It has been not only to encourage more rapid growth, but to enhance palatability. Doesn't it seem at least possible that growth hormones, uniformly young slaughter ages (compared to 50 years ago), and rampant technological development in the packing industry might cause long-term hard-finish feeding to become both obsolete and extravagant -- and in retrospect to be seen as indulgent? I think the point is approaching rapidly when beef palatability will be effected more in minutes in the packing plant than it has been previously effected in months in the feedlot.

TABLE 3: Table 3 addresses what might be called the "industrialization" of the cattle feeding business. It is not unlike the revolution that began to occur in broiler production a quarter-century ago. You will notice that Table 3 can be divided into two parts: feedlots with less than 1000 head capacity, and those with over 1000 head capacity. The number 1000 is very arbitrary but it serves a very useful purpose: it effectively separates farm feedlots - those typical supplementary enterprises of Cornbelt agriculture - from what is loosely known as "commercial" feedlots that are a full-time, primary enterprise for their owners and which, typically and essentially, are in business to sell room and board to someone else's cattle. There has never been a large number of these lots and, in percentage terms, they constitute a very small share of total feedlots. In contrast, there

Table 3: Number of Cattle Feedlots and Fed Cattle Marketings by Size of Feedlots, Principal Feeding, States, U. S. 1962-1978.

	Feedlots More Than 1,000 Capacity			Feedlots Less Than 1,000 Head Capacity		
Year	Number of Lots	Cattle Marketed (1,000 Head)	Percentage of All Cattle Marketed	Number of Lots	Cattle Marketed (1,000 Head)	Percentage of All Cattle Marketed
1962	1,517	5,572	36.5	234,646	9,689*	63.5
1963	1,579	6,118	37.6	230,825	10,156*	62.4
1964	1,668	7,050	38.9	223,071	11,094	61.1
1965	1,787	7,941	42.4	220,164	10,777	57.6
1966	1,921	9,026	44.3	215,296	11,336	55.7
1967	2,034	9,822	45.3	209,581	11,874	54.7
1968	2,080	10,823	47.0	206,516	12,217	53.0
1969**	2,181	12,688	51.5	198,200	11,957	48.5
1970**	2,242	13,675	55.0	181,508	11,205	45.0
1971	2,205	14,761	58.4	163,032	10,520	41.6
1972	2,107	16,536	61.7	152,429	10,275	38.3
1973	2,040	16,363	64.6	144,380	8,968	35.4
1974	1,922	15,069	64.6	135,815	8,261	35.4
1975	1,764	13,219	64.5	136,262	7,275	35.5
1976	1,796	16,244	67.2	130,739	7,926	32.8
1977	1,880	16,934	68.1	130,049	7,927	31.9
1978	1,902	18,103	67.9	131,904	8,542	32.1

* Two estimating series report marketings before and after 1964. The early series reports 1962-64 marketings at 14.361, 15.314, and 17.074 million head. The later series reports 1964 at 18.144 million head, 6.27 percent higher. The figures were adjusted by 6.27 pct. in older series to 15.261, 16.274, and 18.144 million head.

** Marketings are reported for 32 states through 1968. In 1969, marketings from feedlots with more than 1,000 head were reported for 22 states. Figures for 1969 reported here include 1968 data for 10 states excluded from 1969 report. In the 22 states reported, feedlots with more than 1,000 head marketed 51.8 percent of total.

*** Twenty-three states only for 1970 and subsequent years.

Sources: For fed Cattle marketings in feedlots with less than 1,000 head in 1962-63, annual supplements to Livestock and Meat Statistics, Statistical Bulletin 333, SRS, USDA, July, 1963. For all other 1962-66 data, Number of Cattle feedlots by Six Groups, SRS-14, Crop Reporting Board, SRS, USDA, July, 1968. For 1967-70 data, Cattle on Feed, Crop Reporting Board, SRS, USDA, January issues 1969-71. For 1972-1977 data, Livestock and Meat Statistics, annual supplements. For 1978, Cattle on Feed, Crop Reporting Board, ESCS, USDA, January, 1979.

are multitudes of farm feedlots, but those multitudes have declined by over 100,000 since 1962, the year when such data began to be reported. The principal consequence of this change is that, whereas two-thirds of all fed cattle were products of farm feedlots in 1962, two-thirds of all fed cattle were products of the commercial feeding system by 1976. And this trend seems likely to continue as long as cattle feeding manages to endure as an industry. As palatability becomes progressively more a product of the packing plant rather than the feedlot it is possible to imagine that both feeding margins and price differentials by grade will narrow and that the feedlots that endure the longest will be those with the greatest physical efficiency and the lowest break-even cost of production. Past studies have indicated these characteristics to be more commonly found among the large commercial lots than among the smaller supplementary farm enterprises.

TABLES 4 & 5: It is probably useful to look at Tables 4 and 5 together. Each contains the same sort of information, the first for fed cattle and the second for hogs, but the contrast between them is striking. Perhaps the best place to begin is in the bottom, right-hand corner of each table. Note that in the period 1960-1978 the fed cattle industry was a terrific growth industry, doubling in size, while the hog industry was one of stability. What has happened of course is that, as population and income have risen, the per capita consumption of pork has declined somewhat while the per capita consumption of beef has risen rapidly. Note also the contrasts in each table between the East North Central and the West North Central states. Another striking contrast is the difference between the two tables in occurrences in the principal producing states outside the North Central region. In almost all major cattle feeding states outside the North Central states, growth was more rapid than in the Central states. But the opposite

Table 4: Thousands of Fed Cattle Marketed in U. S. Cattle Feeding States - Percentage Distribution by States, and Percentage Changed by Years 1960 and 1978.

Region and State	1960 Fed Cattle Marketings (Thousands)	1960 Percent of U. S.	1978 For Cattle Marketings (Thousands)	1978 Percent of U. S.	1978 as a Percent of 1960
EAST NORTH CENTRAL					
Illinois	1,255	9.6	980	3.7	78.0
Indiana	327	2.5	396	1.5	121.1
Michigan	180	1.4	271	1.0	150.5
Ohio	316	2.4	382	1.4	120.8
Wisconsin	164	1.3	170	0.6	103.6
Total ENC	2,242	17.2	2,199	8.2	98.0
WEST NORTH CENTRAL					
Iowa	2,565	19.6	3,242	12.1	126.3
Kansas	593	4.6	3,471	13.0	585.3
Minnesota	600	4.6	755	2.8	125.8
Missouri	483	3.7	295	1.1	61.0
Nebraska	1,434	11.0	4,170	15.6	290.7
North Dakota	176	1.3	66	0.2	37.5
South Dakota	362	2.8	555	2.0	153.3
Total WNC	6,213	47.6	12,554	47.1	202.0
TOTAL NORTH CENTRAL	8,455	64.7	14,753	55.3	174.4
OTHER FEEDING STATES					
California	1,595	12.2	1,415	5.3	88.7
Colorado	738	5.7	2,455	9.2	332.6
Oklahoma	143	1.1	833	3.1	582.5
Texas	477	3.7	4,915	18.4	1030.3
Other States*	1,652	12.6	2,274	8.5	137.6
Total**	13,060	100.0	26,645	100.0	204.0

* In 1960 includes Arizona, Idaho, Montana, Nevada, New Mexico, Pennsylvania, Oregon, Utah, Washington, and Wyoming. In 1975 Nevada, Utah, and Wyoming are omitted.

** 26 states in 1960 and 23 states in 1978.

Source: Livestock and Meat Statistics, Annual Supplements, June, 1962 and July, 1978.

Table 5: Thousands of Slaughter Hogs Marketed in U. S. by States, Percentage Distribution by States and Regions, and Percentage Change by Years, 1960 and 1978.

Region and State	1960 Slaughter Hog Marketings (Thousands)	1960 Percent of U. S.	1978 Slaughter Hog Marketings (Thousands)	1978 Percent of U. S.	1978 as a Percent of 1960
NORTH EAST	1,074	1.3	1,150	1.4	107.0
EAST-NORTH CENTRAL					
Ohio	4,064	5.1	2,451	3.0	60.3
Indiana	7,348	9.2	5,861	7.2	79.7
Illinois	10,651	13.2	9,208	11.3	86.4
Michigan	1,096	1.4	892	1.1	81.3
Wisconsin	3,335	4.2	2,630	3.2	78.8
Total ENC	26,494	33.1	22,192	27.3	83.7
WEST-NORTH CENTRAL					
Minnesota	5,660	7.1	6,315	7.7	111.5
Iowa	18,457	23.1	19,672	24.2	106.5
Missouri	5,709	7.1	5,820	7.1	101.9
North Dakota	487	0.6	423	0.5	86.8
South Dakota	2,236	2.8	2,662	3.3	119.0
Nebraska	3,577	4.5	4,949	6.1	138.3
Kansas	1,645	2.1	3,014	3.7	183.2
Total WNC	37,771	47.3	42,855	52.8	113.5
	64,265	80.4	65,047	80.1	101.2
SOUTH CENTRAL					
Kentucky	1,794	2.2	1,568	1.9	87.4
Tennessee	1,610	2.0	1,821	2.2	113.1
Alabama	1,255	1.6	995	1.2	79.2
Mississippi	618	0.8	448	0.5	72.5
Arkansas	496	0.6	615	0.7	124.0
Louisiana	237	0.3	166	0.2	70.0
Oklahoma	553	0.7	427	0.5	77.2
Texas	1,127	1.4	1,240	1.5	110.0
Total SC	7,690	9.6	7,280	9.0	94.6
SOUTH ATLANTIC	5,257	6.6	7,131	8.8	135.6
WEST	1,652	2.1	1,736	2.1	105.0
TOTAL (48 States)	79,938	100.0	81,194	100.0	101.5

Source: Livestock and Meat Statistics, Annual Supplements, June 1962 and July, 1978. Meat Animals, Production, Disposition, Income, April, 1979.

is true in the hog industry. Only the South Atlantic region managed to increase its percentage contribution to the national total of slaughter hog marketings during this same 1960 - 1978 period.

Let us turn to some other aspects of change in the industry which have to do more with developments in pricing, supply response and management characteristics than to regional shifts and changing livestock populations.

FIGURE 4: Let us begin with some basic, raw data. Here is a graphic presentation of 100 years of cattle cycles in the United States. This, incidentally, is all the cattle cycles there are: prior to 1880 there was only constant, continuous growth evidencing no cyclical pattern. There is an obvious pattern to this basic, cyclical data that has the ability to be both enlightening and confusing. For example, it is fairly obvious that a linear trend is not the best possible regression fit that could be obtained for these cycles. Also, it seems apparent that the most recent cattle cycle was perhaps the largest cyclical variation the industry has seen. But this is not true.

FIGURE 5: When transparencies are employed it is possible to see rather clearly that there are two separate rates of growth for the cattle industry. The more rapid rate of growth beginning in the late thirties to early forties might be associated with the end of the Depression, or the all-out effort of the World War II years, and perhaps with the initiation of cattle feeding as a scientifically serious application of rapidly accumulating basic knowledge about animal nutrition.

These two linear periods were regressed on time to erase the cyclical influence in order that we might see the basic trend in cattle population. But they can be applied in a further, interesting way, and that is to regard them as the base-line around which production cycles fluctuate.

Figure 4

RAW JANUARY 1 CATTLE INVENTORY, UNITED STATES, 1880 - 1980

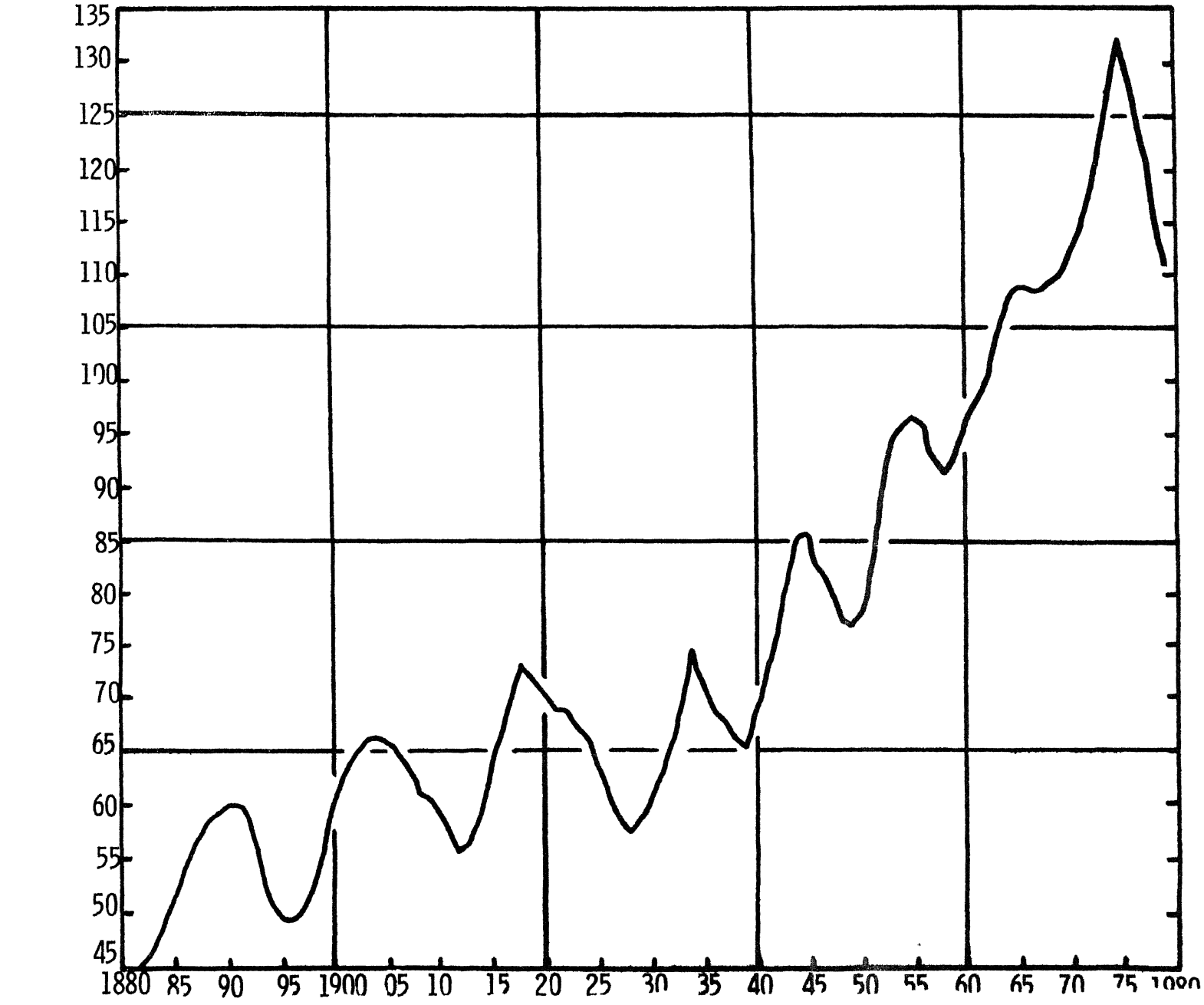


Figure 5

STRAIGHT LINE TREND OF INVENTORY REGRESSED ON TIME, U. S., 1880-1980

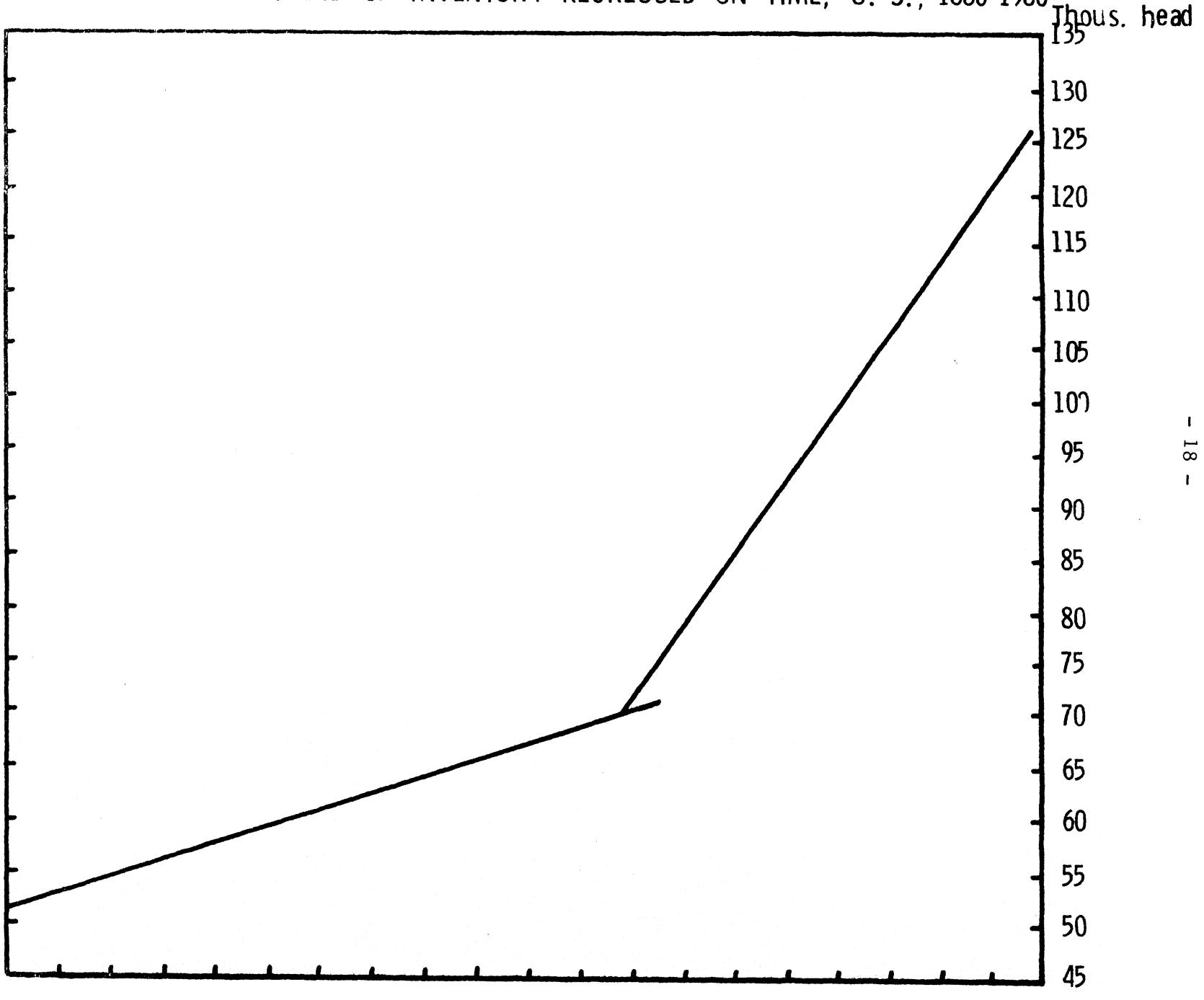


FIGURE 6: Then it is possible to construct a graphic presentation like this. What has been done here is to use the trend-line value for each year as the numerator in a simple division where actual production was the denominator. This had the effect of treating the regression line constantly as 100 percent and the quotient as the percentage variation from the base line for each individual year. (Actually, to further remove aberrations that might here or there prove distracting, a moving three-year average of annual production was employed as the denominator.) Three things are quickly evident: (1) cattle cycles are getting shorter, early ranging 14-16 years and lately 10 years; (2) the amplitude of variation is decreasing, but only uncommonly did any extreme of any cycle ever vary more than 10 percent from the basic production trend; and (3) the last cycle was not extravagantly large, but only appeared so because the largest populations in the history of the industry were involved. I am not certain that I am either correct or complete, but it is my inclination to treat this evidence about cycles as an indication of improvements in marketing information and to management improvements in supply response to that information.

FIGURE 7: It is also interesting to examine price behavior and, by developing transparencies for overlays to see a graphic presentation of price-quantity relationships. Figure 7 is so designed. (The axes of Figure 7 are identified completely only when it is used as an overlay in conjunction with Figure 6). What we have here is the USDA price series representing the average per-head value of the January 1 inventory which, in turn, is the basis for the cycle data already presented. Figure 7 is a three-year moving average of the basic USDA price data which has in turn been deflated by the Consumer Price Index. Several interesting patterns are evident in this figure, particularly when it is used as an overlay in conjunction with Figure 6; (1) While cattle number cycles have dampened, cattle price cycles

Figure 6

THREE - YEAR MOVING AVERAGE OF CATTLE INVENTORY AS PERCENTAGE VARIATION AROUND TREND REGRESSED AGAINST TIME, U. S., 1880-1980

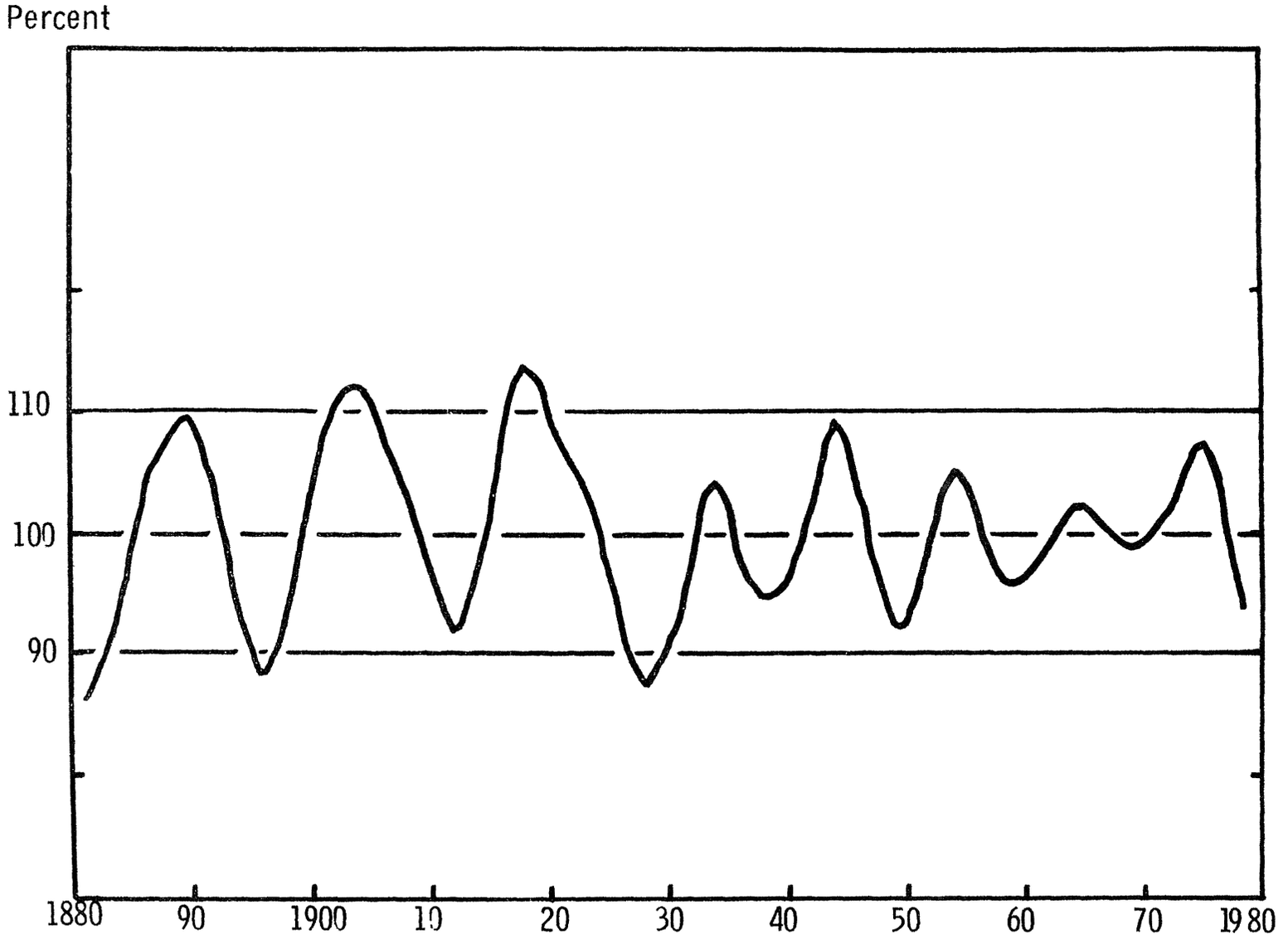
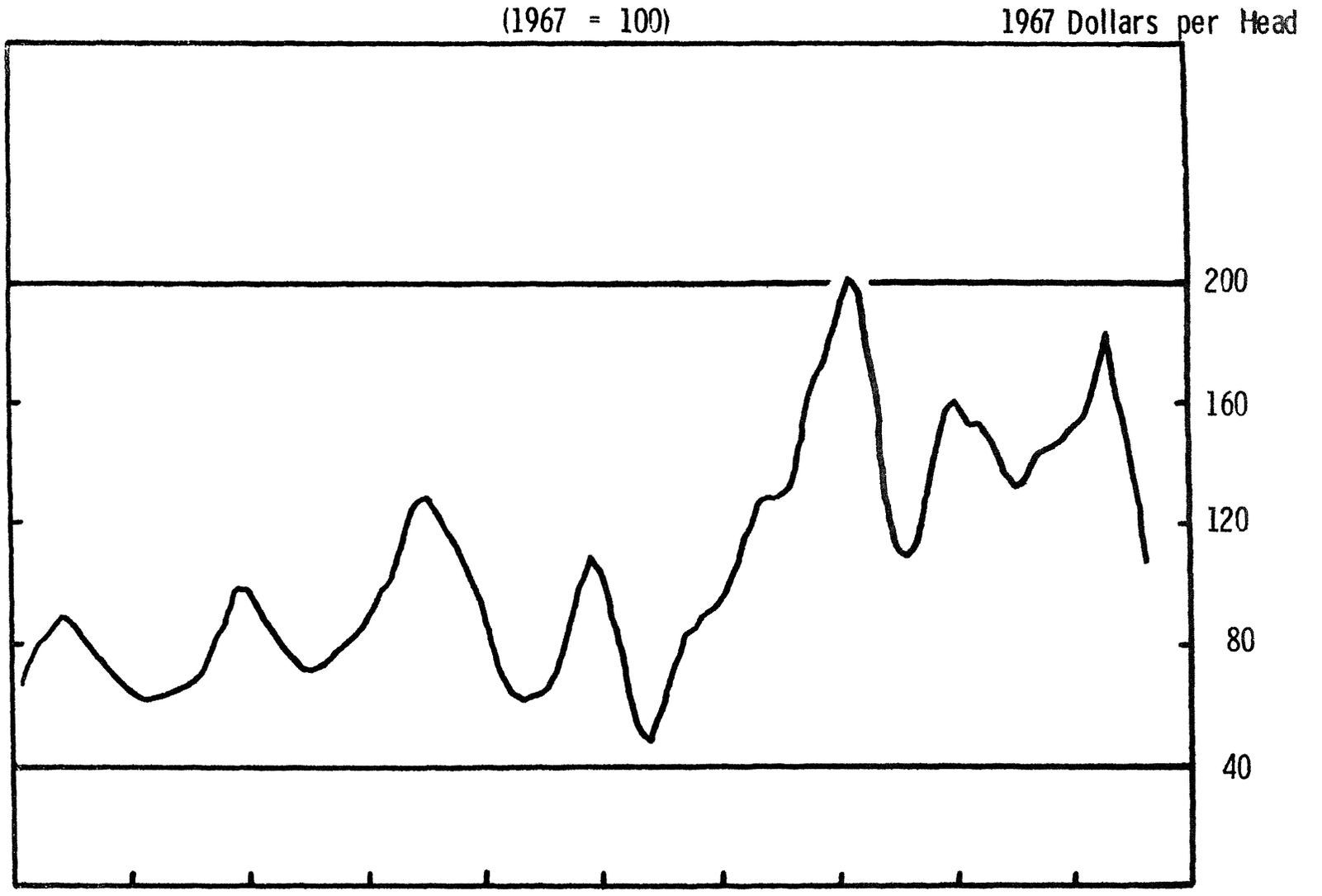


Figure 7

THREE - YEAR MOVING AVERAGE OF CONSTANT VALUE PER HEAD OF JANUARY 1 INVENTORY, DEFLATED BY CPI, UNITED STATES, 1880-1980



have widened; prices are more volatile than formerly; (2) a classic price-quantity relationship is easiest and most consistently seen in the early cycles of the century and tend to become somewhat obscure in the later cycles; (3) the cyclical break in prices never coincides precisely with the cattle population cycle: there is a normal lag in price response and the price break normally appears somewhere in the recovery phase of the quantity cycle. This is useful information to any astute producer. The fact that the numbers cycle has clearly bottomed and is in a recovery phase does not necessarily mean the time has arrived for the astute producer to consolidate. There may be a profitable grace period of a year or two in there and he may want to regard it as a management responsibility to make some assessment of that probability. Finally (4) it is apparent that there is a general overall rise in the per-head value of the January 1 inventory at about the same time in the century when the linear trend in production accelerated, i.e., in the late thirties to early forties. Again, I tend to associate this with the advent of the war effort as perhaps a catalytic effect on scientifically serious feeding. Understand, now, we are dealing with deflated dollars yet they insist that an increase in value per head occurred over a period spanning perhaps two decades. I am inclined to regard this as a reflection of the increased value of the finished, fed product which has been capitalized into expectations for what the January 1 inventory will in time become.

The thing that intrigues me about the price pattern here displayed is its increased volatility relative to variations in recent cattle cycles. This is occurring in a time period following the rash of anti-trust moves which we like to teach had a commendable impact on price competition and pricing performance. It is occurring in a time period when concentration ratios in meatpacking were clearly lower than prior to the depression. It

is occurring in a period when Federal grades became widely and uniformly applied. There is some convenient circumstantial evidence, you see, to suggest that this price volatility is not necessarily or perhaps even likely a product of price manipulation by powerful market forces. But it is also necessary to acknowledge that this increase in price volatility is chronologically related to the growth in market power of retail food chains and the gradual shift of market power in meat wholesaling from the packer to the retailer. So, we are left with the usual conflicting and frequently unprovable indications of price performance as a consequence of price manipulation in a market where power is present.

But there is another possibility that is just as plausible and probably more fruitful and equally intriguing and maybe more correct: it is diminishing marginal utility. It has been a cornerstone of market economics that all growth markets can be saturated and that during this continuing process the utility of the product is decreasing at an increasing rate at the margin. The product deteriorates from a once-fine good of quality and perhaps even specialty status to, in time, a shopping good and, in the end, a convenience good. The elasticity of demand for any product is effected more by its utilitarian status in combination with its position in the scarcity-abundance spectrum than with any other factors. I am simply submitting, conjecturally, that this entire proposition is reasonable and could be stated hypothetically and could be tested empirically and that the result over time would show a gradually declining price elasticity of demand and, thereby, an increasingly volatile price reaction relative to variations in quantity.

We cannot witness the rampant growth of the fast-food chains, the decreasing price-quality differential between cow beef and fed beef, the increasing share of the carcass (of all grades) going through the grinder,

and continue to suppose that beef occupies a position of unique superiority at the meat counter. Beef is an abundant convenience good. Your mind may be holding the loin in reserve, with which to cite the exception that will decimate my argument. Well, if the loin is the exceptional citadel on the mountain top I think my response is that the flanks of the mountain and all the surrounding geography of the beef industry have already succombed to the new technologies effecting beef consumption. You cannot afford to feed the animal just for the loin. You cannot afford to man and equip the citadel. It is futile to suppose the citadel commands the countryside. The loin will be abandoned, I think, as the salvation of the feeding industry. It will be abandoned to the technologies of the packing industry.

FIGURES 8 & 9: I would like to close with a few speculative remarks about the management function in agriculture. I made the same remarks to this same group perhaps as many as 10 years ago. I believe in them more firmly even today. I've tested them out in class with students. I've used them as food for thought when I read my weekly news magazines or otherwise watched the passing scene as the changes develop. Figure 8 is standard material in every marketing textbook. I dislike it. I think it disarms and distracts those to whom it is taught. It implies, even in the selection of major titles for the three categories, that five important things happen. Then it says that another five things facilitate the occurrence of the first five. It lets a partially-alert student (and that's the commonest kind) interpret this to mean the the first five are important and will happen, and the second five are nice and help things happen but the first five would happen anyway, even without the second five.

I like Figure 9 better. It puts the emphasis where it belongs. It establishes the priorities the way they really are. Nothing happens without

FIGURE 8

FUNCTIONS OF EXCHANGE

BUYING

SELLING

FUNCTIONS OF PHYSICAL SUPPLY

MANUFACTURING

TRANSPORTATION

STORAGE

FACILITATING FUNCTIONS

INFORMATION

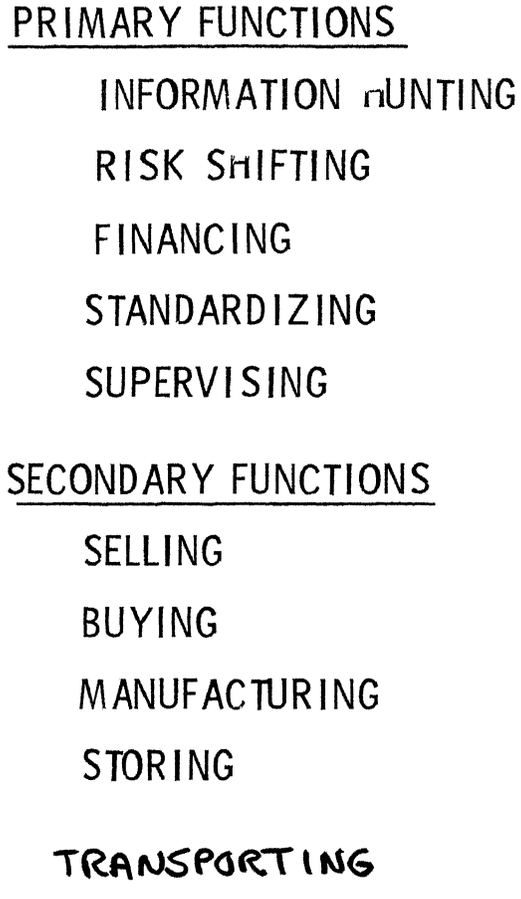
RISK

FINANCING

STANDARDIZATION

SUPERVISION

FIGURE 9


PRIMARY FUNCTIONS
INFORMATION GATHERING
RISK SHIFTING
FINANCING
STANDARDIZING
SUPERVISING
SECONDARY FUNCTIONS
SELLING
BUYING
MANUFACTURING
STORING
TRANSPORTING

the first five. Excellence, true excellence, even in the selling of a superior and unique recipe of luncheon meat, is impossible without total mastery of the first five. Consider, please, or reconsider, the kinds of changes you have witnessed in agriculture in the past 10 years; the kinds of changes that sometimes somehow distressed you, made you feel uneasy or confused. Isn't it true that much you have seen has been obviously the product of a mysterious mastery of these primary functions by people who generally were strangers to the ordinary agricultural scene? That says it in a sentence: recent agricultural change has been the appearance of mysteries introduced to agriculture by strange outsiders that nobody in the "Agricultural Establishment" really knows.

How many farmers, supply dealers, packer buyers, do you know whose thought processes and priorities look like Figure 8? Lots of them. They're everywhere, and hurting. How many farmers do you know whose thought processes are arranged in priorities like Figure 9, and have the training to feel comfortable with that arrangement of decision-making priorities? You don't know many! I know you don't know many. Because there aren't very many. But you know there are some. You've heard of a few. You know they exist. And worst of all, you know it doesn't take very many. They are an extremely small minority, like the number of large feedlots. But they already dominate agriculture and account for the great majority of agricultural income. I submit to you that the future of agriculture will be characterized by activities that have the effect of changing Figure 8 into Figure 9. And that's my forecast for the livestock industry, too.

Let me ask you one final, closing question: what do you have, by way of professional credentials, that qualify you as the expert you are paid to be in advocating this change and helping it to occur?